

## CHAPTER 2

### DESCRIPTION OF THE LOWER HATCHIE RIVER WATERSHED

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**2.1. BACKGROUND.** The Hatchie River and Watershed derive their name from the Chickasaw Native Americans (the syllable “Chie” is believed to mean flowing water).

The Hatchie River is a major watercourse of southwestern Tennessee. It is of considerable geographic, cultural, and historic significance. In large measure this is due to the fact that it is the only major stream of West Tennessee that has never been impounded, channelized, or otherwise modified by human activity to any major degree, although several of its tributaries have. Its environs are indicative of what much of West Tennessee must have resembled prior to the time of pioneer settlement in the early 19<sup>th</sup> century.

The Hatchie River originates in northern Mississippi and crosses into Hardeman County, TN near the community of Pocahontas. The Hatchie flows north, in a very

roundabout, sinuous way, then turns northwest toward the Hardeman County seat of Bolivar. While there is usually a discernable main channel, the Hatchie at this point is largely a zone of wetlands approximately one mile wide. Bolivar was the head of navigation for small, shallow-draught steamboats in the 19th century.

From Bolivar, the Hatchie continues generally northwest, crossing into Haywood County and the southwestern corner of Madison County. At this point it enters the Hatchie National Wildlife Refuge. The rest of the stream course from this point generally trends west. There is a "bow" to the north in the final part of the stream course, which forms the line between Tipton County and Lauderdale County. The Hatchie enters the Mississippi River just north of the Hatchie Towhead and just south of the Lower Hatchie National Refuge. The Hatchie River is designated as a "scenic river" under the Tennessee Wild and Scenic Rivers Act.

This Chapter describes the location and characteristics of the Lower Hatchie River Watershed.

## 2.2. DESCRIPTION OF THE WATERSHED.

**2.2.A. General Location.** The Tennessee portion of the Lower Hatchie River Watershed is located in West Tennessee and includes parts of Chester, Fayette, Hardeman, Haywood, Lauderdale, Madison, and Tipton Counties.



*Figure 2-1. General Location of the Lower Hatchie River Watershed.*

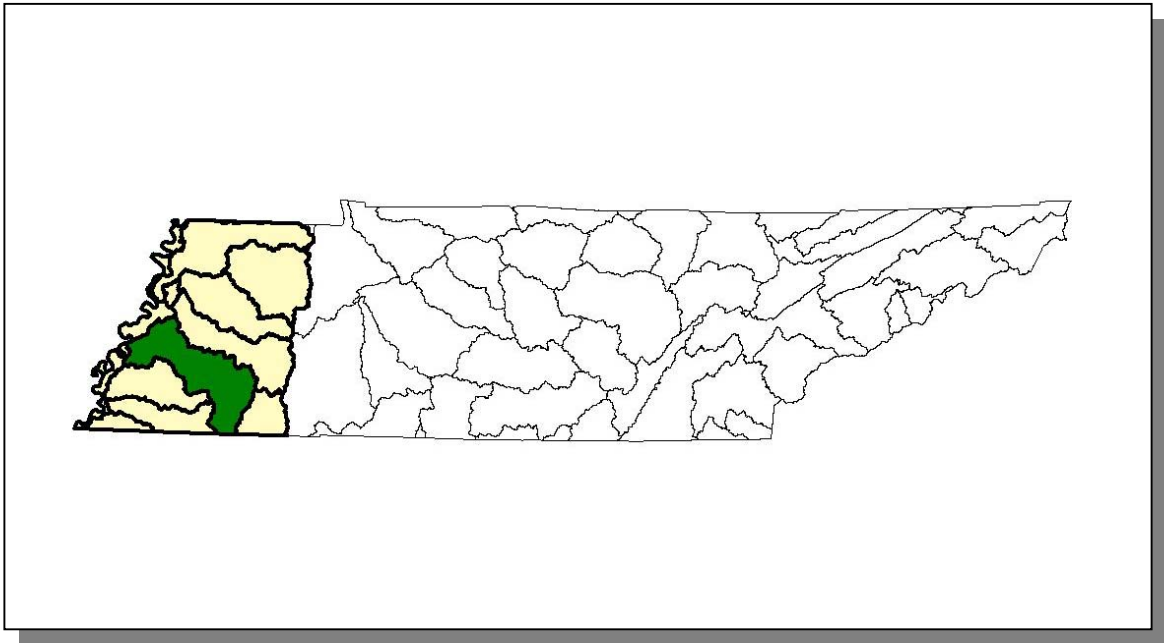
COUNTY	% OF WATERSHED IN EACH COUNTY
Hardeman	36.4
Haywood	21.5
Tipton	16.2
Lauderdale	12.2
Fayette	6.3
Madison	5.5
Chester	1.9

*Table 2-1. The Tennessee Portion of the Lower Hatchie River Watershed Includes Parts of Seven West Tennessee Counties.*



### 2.3. GENERAL HYDROLOGIC DESCRIPTION.

**2.3.A. Hydrology.** The Lower Hatchie River Watershed, designated 08010208 by the USGS, is approximately 1,461 square miles (1448 square miles in Tennessee) and drains to the Mississippi River.

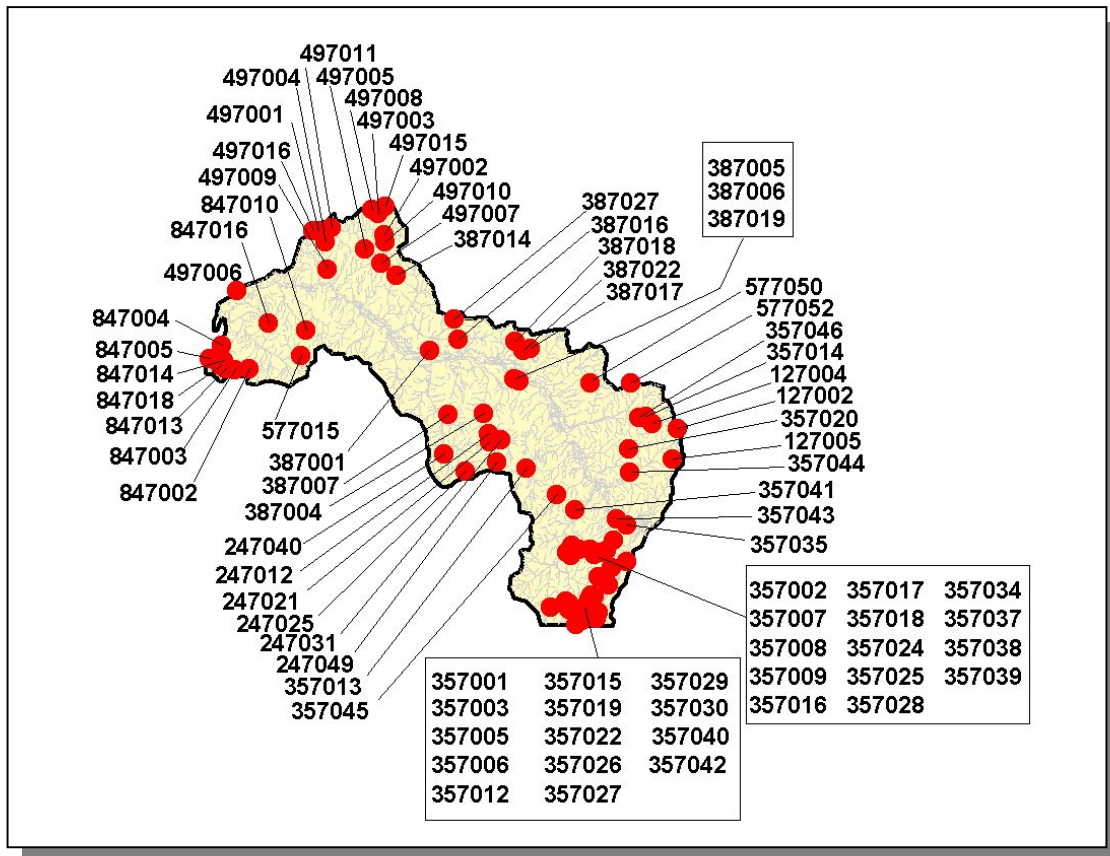


*Figure 2-3. The Lower Hatchie River Watershed is Part of the Mississippi River Basin.*



**Figure 2-4. Hydrology in the Tennessee Portion of the Lower Hatchie River Watershed.** There are 2,530.8 stream miles recorded in River Reach File 3 in the Tennessee portion of the Lower Hatchie River Watershed. Location of the Hatchie River and the cities of Bolivar, Brownsville, Covington, Ripley, and Saulsbury are shown for reference.

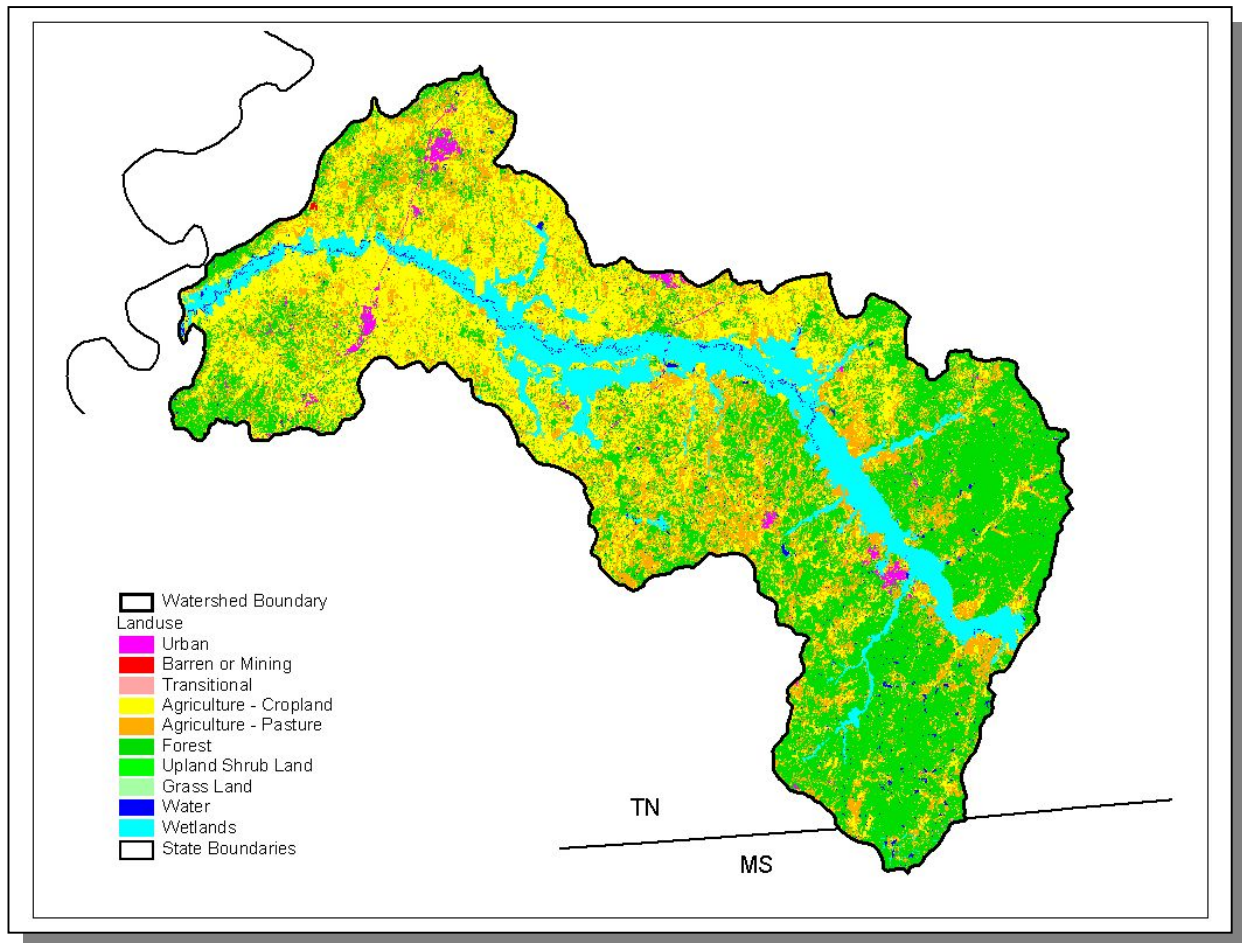
**2.3.B. Dams.** There are 83 dams inventoried by TDEC Division of Water Supply in the Tennessee portion of the Lower Hatchie River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.



**Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Lower Hatchie River Watershed.** More information, including identification of inventoried dams labeled, is provided in Appendix II and at <http://gwidc.memphis.edu/website/dams/viewer.htm>.

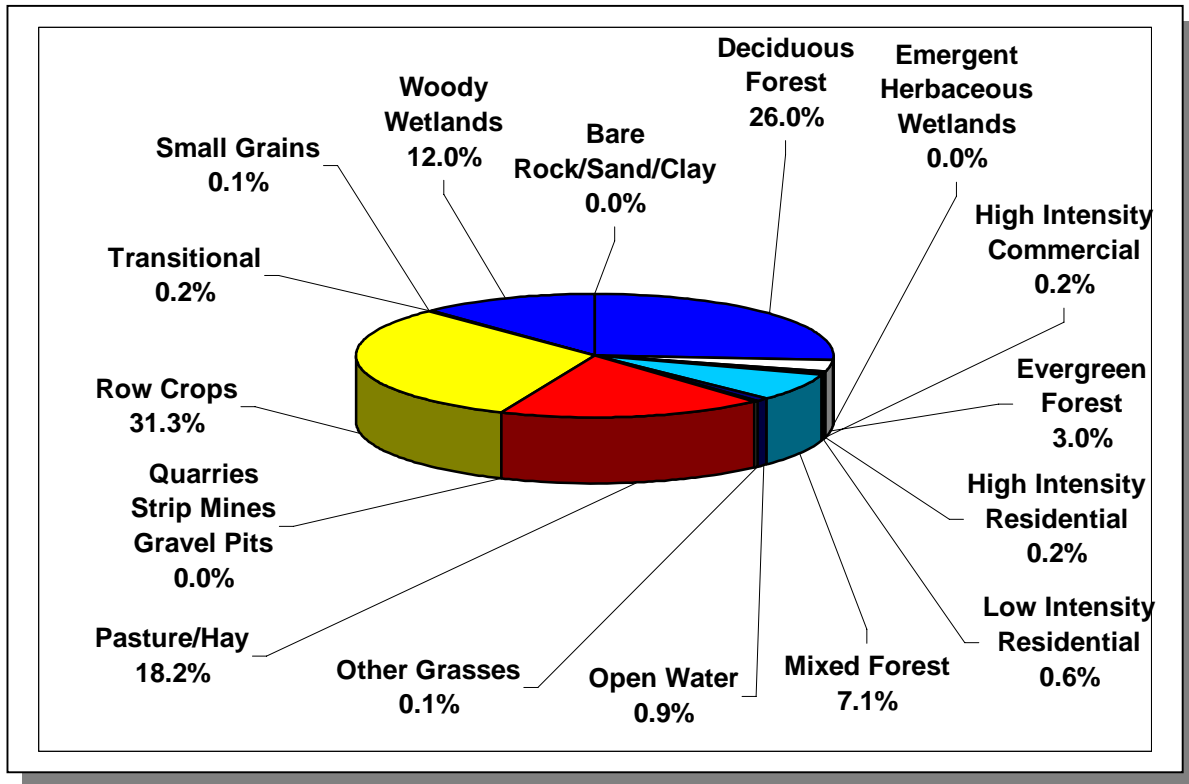


**2.4. LAND USE.** Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

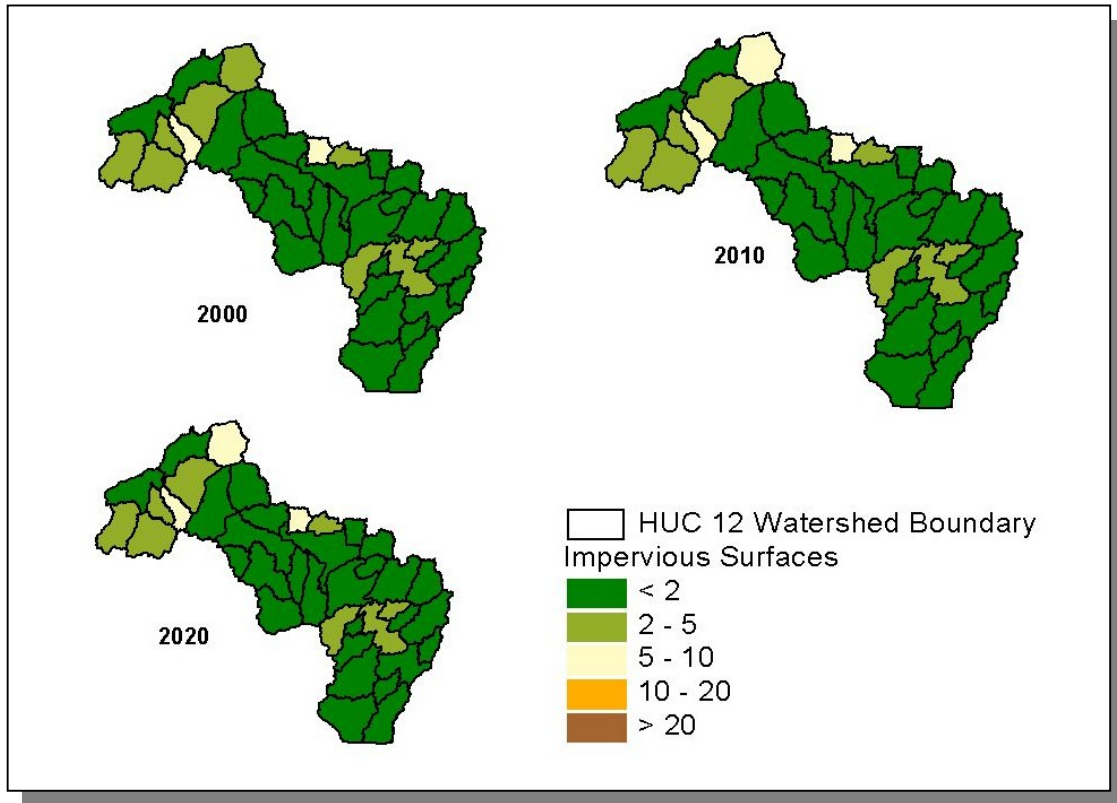


**Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.**





**Figure 2-7. Land Use Distribution in the Tennessee Portion of the Lower Hatchie River Watershed.** More information is provided in Appendix II.



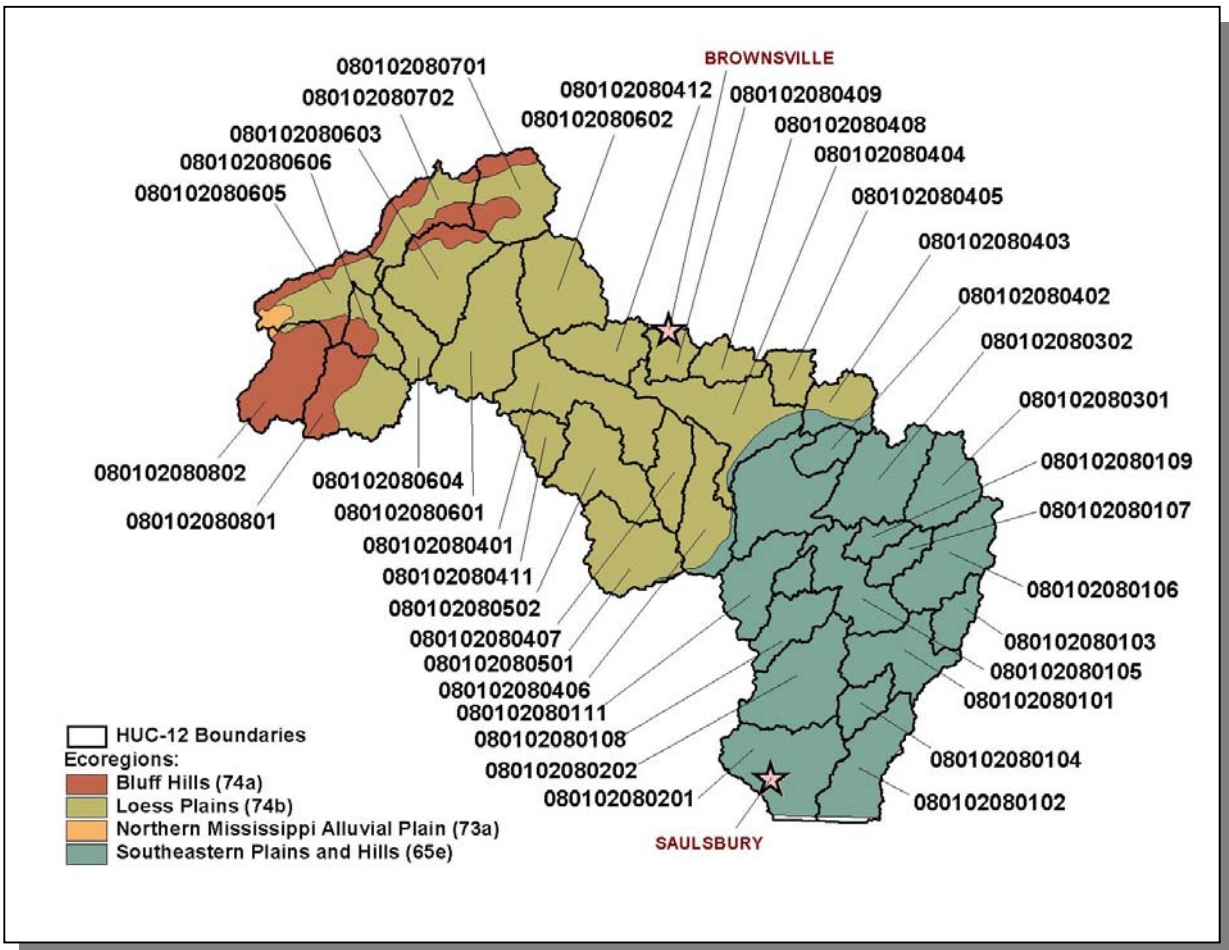
**Figure 2-8. Illustration of Total Impervious Area in the Tennessee Portion of the Lower Hatchie River Watershed.** All HUC-12 subwatersheds are shown. Current and projected total impervious cover (percent of total area) is provided by EPA Region 4. More information can be found at: <http://www.epa.gov/ATHENS/research/impervious/>

**2.5. ECOREGIONS AND REFERENCE STREAMS.** Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Tennessee portion of the Lower Hatchie River Watershed lies within 3 Level III ecoregions (Southeastern Plains, Mississippi Alluvial Plain, and Mississippi Valley Loess Plains) and contains 4 Level IV subecoregions:

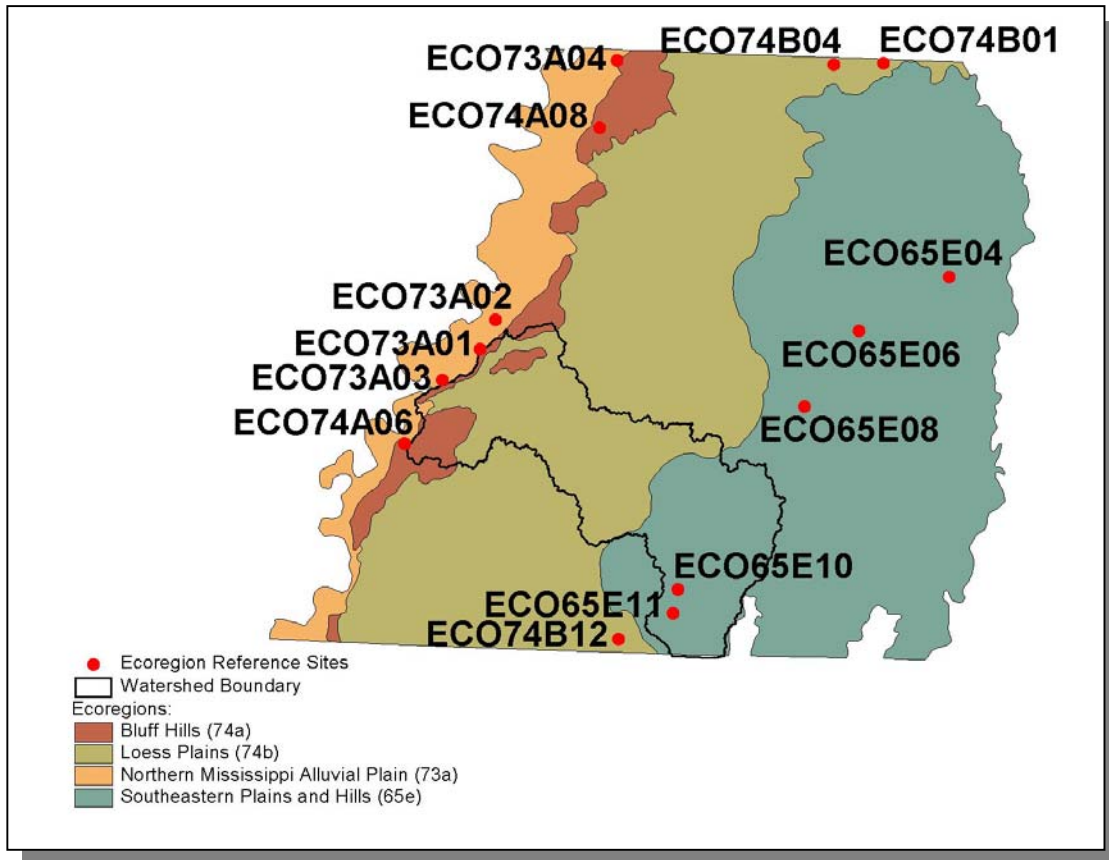
- The **Southeastern Plains and Hills (65e)** contains north-south trending bands of sand and clay formations. Tertiary-age sand, clay, and lignite are to the west, with Cretaceous fine sand, fossiliferous micaceous sand, and silty clays to the east. Elevations reach over 650 feet with more rolling topography and relief than the Loess Plains (74b) to the west. Streams have increased gradient, sandy substrates, and distinct faunal characteristics. Natural vegetation is oak-hickory forest, grading into oak-hickory-pine to the south.
- The **Northern Mississippi Alluvial Plain (73a)** within Tennessee is a relatively flat region of the Quaternary alluvial deposits of sand, silt, clay, and gravel. It is bounded distinctly on the east by the Bluff Hills (74a), and on the west by the Mississippi River. Average elevations are 200-300 feet with little relief. Most of the region is in cropland, with isolated areas of deciduous forest. Soybeans, cotton, corn, sorghum, and vegetables are the main crops. The natural vegetation consists of Southern floodplain forest (oak, tupelo, bald cypress). The two main distinctions in the Tennessee portion of the ecoregion are between areas of loamy, silty, and sandy soils with better drainage, and areas of more clayey soils of poor drainage that may contain wooded swamp-land and oxbow lakes. Waterfowl, raptors, and migratory songbirds are relatively abundant in the region.
- The **Loess Plains (74b)** gently rolling, irregular plains, 250-500 feet in elevation, with loess up to 50 feet thick. The region is a productive agricultural area of soybeans cotton, corn, milo, and sorghum crops, along with livestock and poultry. Soil erosion can be a problem on the steeper, upland Alfisol soils. Bottom soils are mostly silty Entisols. Oak-hickory and southern floodplain forests are the natural vegetation types, although most of the forest cover has been removed for cropland. Some less-disturbed bottomland forest and cypress-gum swamp habitats still remain. Several large river systems with wide floodplains; the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf, cross the region. Streams are low-gradient and murky with silt and sand bottoms. Most of the streams have been channelized.

- The **Bluff Hills (74a)** consist of sand, clay, silt, and lignite, and are capped by loess greater than 60 feet deep. The disjunct region in Tennessee encompasses those thick loess areas that are generally the steepest, most dissected and forested. The carved loess has a mosaic of microenvironments, including huge dry slopes and ridges, moist slopes, ravines, bottomland areas, and small cypress swamps. While oak-hickory is the general forest type, some of the undisturbed bluff vegetation is rich in mesophytes, such as beech and sugar maple, with similarities to hardwood forests of eastern Tennessee. Smaller streams of the Bluff Hills have localized reaches of increased gradient and small areas of gravel substrate that create aquatic habitats that are distinct from those of the Loess Plains (74b) to the east. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches. Gravels are also exposed in places at the base of the bluffs.



**Figure 2-9. Level IV Ecoregions in the Tennessee Portion of the Lower Hatchie River Watershed.** HUC-12 subwatershed boundaries and locations of Brownsville and Saulsbury are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.



**Figure 2-10. Ecoregion Monitoring Sites in Level IV Ecoregions 65e, 73a, 74a, and 74b.** The Tennessee portion of the Lower Hatchie River Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 01/01/2006, is provided in Appendix II.

## 2.6. NATURAL RESOURCES.

**2.6.A. Rare Plants and Animals.** The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Mussels	2
Amphibians	1
Birds	5
Fish	4
Mammals	6
Reptiles	3
Plants	12
<b>Total</b>	<b>33</b>

**Table 2-3. There are 33 Known Rare Plant and Animal Species in the Tennessee Portion of the Lower Hatchie River Watershed.**

In the Tennessee portion of the Lower Hatchie River Watershed, there are four known rare fish species, one rare amphibian species, and two known rare mussel species.

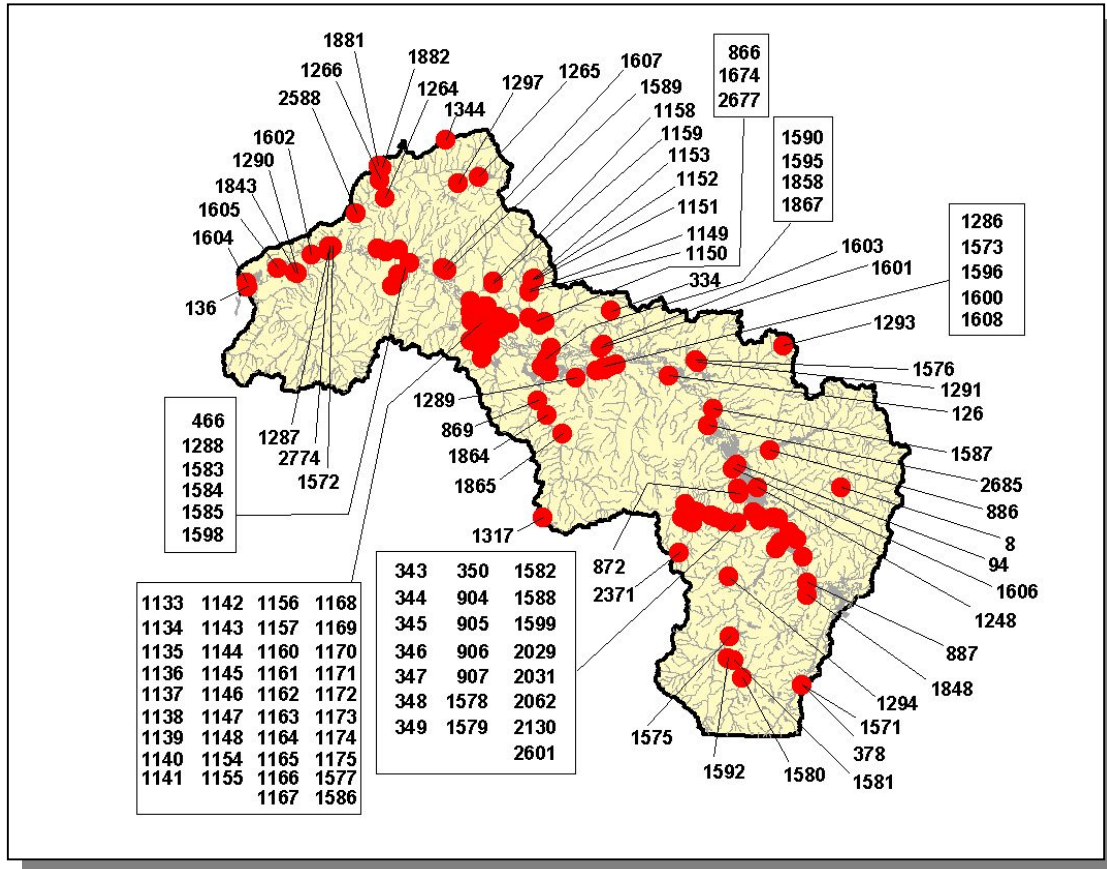
SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Ammocrypta beani</i>	Naked sand darter		D
<i>Ammocrypta vivax</i>	Scaly sand darter		D
<i>Cycleptus elongates</i>	Blue sucker		T
<i>Noturus stigmosus</i>	Northern madtom		D
<i>Obovaria jacksoniana</i>	Southern hickorynut		
<i>Villosa vibex</i>	Southern rainbow		
<i>Hyla gratiosa</i>	Barking tree frog		D

**Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Lower Hatchie River Watershed.** Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service, MC, Management Concern for U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/na/>.



**2.6.B. Wetlands.** The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

<http://www.state.tn.us/environment/na/wetlands/>



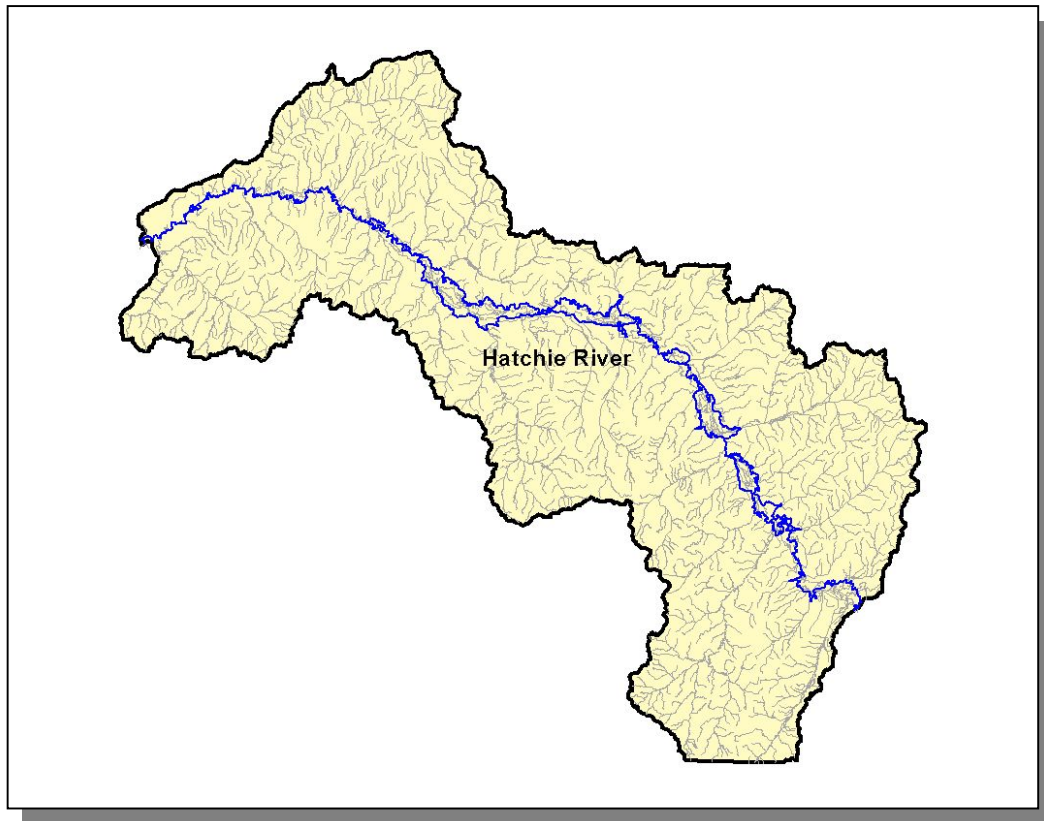
**Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in the Tennessee Portion of the Lower Hatchie River Watershed.** This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.



## 2.7. CULTURAL RESOURCES.

**2.7.A. State Scenic River.** The Tennessee portion of the Hatchie River is designated a State Scenic River.

**Hatchie River** is designated as a Class I Natural River Area as a swamp river.



**Figure 2-12. The Tennessee Portion of the Hatchie River is Designated a State Scenic River.** More information can be found at <http://www.state.tn.us/environment/nh/scenicrivers/>.

**2.7.B. Nationwide Rivers Inventory.** The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of one stream in the Tennessee portion of the Lower Hatchie River Watershed:

Hatchie River (RM 0 to RM 163) is a slow, meandering swamp river with many oxbows surrounded by wilderness and inhabited by a large, diversified wildlife population, including rare species.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Hatchie River	X	X	X	X	X	X	X

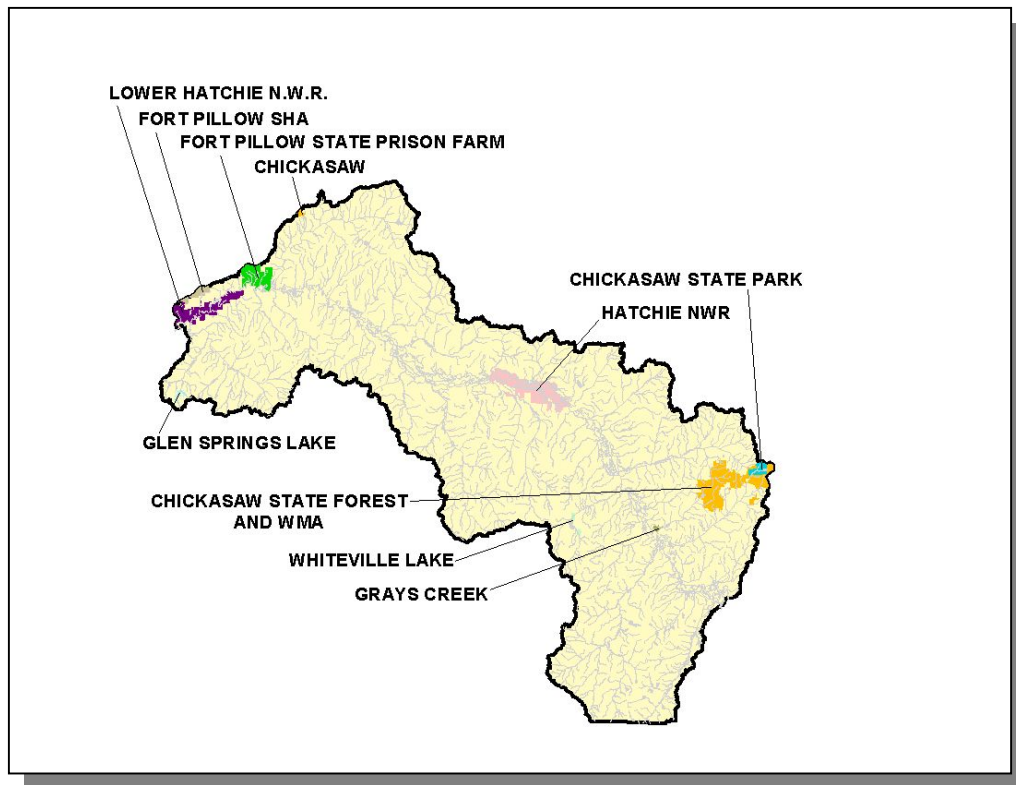
**Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.**

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/>

**2.7.C. Public Lands.** Some sites representative of the cultural heritage are under state or federal protection:

- Chickasaw National Wildlife Refuge is a 25,006-acre complex located near Ripley. More information may be found at <http://www.fws.gov/Refuges/profiles/index.cfm?id=42526>.
- Chickasaw State Forest is a 12,571-acre state forest located in Chester and Hardeman Counties. At the time most of the lands were purchased by the federal Resettlement Administration Program in 1938 it was highly eroded and degraded by farming and timber harvesting. The lands were deeded to the state in 1955. More information may be found at <http://www.state.tn.us/agriculture/forestry/stateforests/1.html>
- Chickasaw State Park is located on some of the highest terrain in West Tennessee. Started as a Works Progress Administration (WPA) project in 1934, it came under state management in 1939. More information may be found at <http://www.state.tn.us/environment/parks/parks/Chickasaw/>
- Chickasaw Wildlife Management Area is an 11,215-acre area managed by TWRA in Hardeman and Chester Counties.
- Fort Pillow State Historic Area is a 1642-acre park located in on the Chickasaw Bluffs of Lauderdale County. The site has both historical and archaeological significance. More information may be found at: <http://www.state.tn.us/environment/parks/parks/FortPillow/>
- Fort Pillow State Prison Farm is operated by the Tennessee Department of Corrections.

- Glen Springs Lake is a 310-acre lake in Tipton County and is owned and operated by the Tennessee Wildlife Resources Agency for Fishing. More information may be found at:  
<http://www.state.tn.us/twra/fish/pond/famlake/glennsprings.html>
- Grays Creek is a 20-acre area managed by Tennessee Wildlife Resources Agency in Hardeman County. More information may be found at  
<http://www.state.tn.us/twra/grayswma.html>.
- Hatchie NWR is an 11,556-acre refuge established in 1964. The refuge is located entirely in Haywood County. More information may be found at  
<http://www.fws.gov/hatchie/>
- Lower Hatchie NWR is a 10,331-acre refuge located in Lauderdale and Tipton Counties. More information may be found at  
<http://www.fws.gov/southeast/pubs/facts/lhacon.pdf>.
- Whiteville Lake is a 158-acre area managed by Tennessee Wildlife Resources Agency in Hardeman County. More information may be found at  
<http://www.state.tn.us/twra/fish/pond/famlake/whiteville.html>.



**Figure 2-13. Public Lands in the Tennessee Portion of the Lower Hatchie River Watershed.**  
Data are from Tennessee Wildlife Resources Agency. NWR, National Wildlife Refuge; SHA, State Historical Area; SNA, State Natural Area; WMA, Wildlife Management Area.

**2.8. TENNESSEE RIVERS ASSESSMENT PROJECT.** The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Bear Creek	1			Mill Creek	4		
Big Black Creek	4	4		Muddy Creek			
Big Muddy Creek Canal	3		2	Oak Dain Creek	4		
Cane Branch	3			Pennycost Creek	4		
Cane Creek	4	3	2,3	Piney Creek			
Carters Creek	4			Pleasant Run Creek	3		
Clear Creek	3,4			Poplar Creek	1,4	2,4	
Clover Creek	3,4			Porters creek	4		
Copper Springs Creek	3			Potters Creek	4		
Cypress Creek	3			Richland Creek	4		
District Branch Lagoon Creek	3			Saulsbury Creek	3		
Dry Creek	3			Short Creek	4		
East Fork Spring Creek	3		3	Smart Creek	3		
Flat Creek	3			Spring Creek	2	2,3	3
Grays Creek	2			Stewart Branch Porters Creek	3		
Groggins Creek	3			Sugar Creek	3	4	
Hatchie River	1,2,3	1,2	2	Town Creek	4		2
Hickory Creek	4	4		Unnamed Trib to Cane Creek	4		
Hurricane Creek	3			Unnamed Trib to Carters Creek	4		
Hyde Creek	4			Unnamed Trib to Hatchie River (North)	4		
Indian Creek	4			Unnamed Trib to Hatchie River (South)	4		
Jeffers Creek	3			Unnamed Trib to Little Muddy Creek	4		
Lagoon Creek	2			Wade Creek	4		
Little Muddy Creek	4			West Fork Spring Creek			1
Marshall/Snow Creek	3						

**Table 2-6. Tennessee Rivers Assessment Project Stream Scoring in the Lower Hatchie River Watershed.**

Categories: NSQ, Natural and Scenic Qualities  
RB, Recreational Boating  
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery  
2. Regional Significance; Good Fishery  
3. Local Significance; Fair Fishery  
4. Not a significant Resource; Not Assessed